

What is claimed is:

1. A modular sensor assembly of a towed array comprising:  
  
a support structure having opposed upper and lower plates spaced apart by vertical sectioning walls and defining discrete chambers of said support structure;  
  
an acoustically absorptive hub positioned centrally in said support structure and in communication with said discrete chambers; and  
  
a sensor element secured in a selected chamber of said support structure.
2. The assembly according to claim 1 wherein said support structure is an integrally formed viscoelastic housing.
3. The assembly according to claim 1 wherein said support structure is a cylindrical housing having a central axis with said vertical sectioning walls arranged radially thereabout, said acoustically absorptive hub being positioned at the central axis of said support structure.
4. The assembly according to claim 3 wherein said support structure is integrally formed of a viscoelastic material.

5. The assembly according to claim 1 wherein said sensor element is secured within said selected chamber of the support structure by structural adhesive.

6. The assembly according to claim 5 wherein said sensor element is secured to an outer surface of said acoustically absorptive hub with structural adhesive.

7. The assembly according to claim 1 wherein said sensor element is secured to an outer surface of said acoustically absorptive hub with a structural adhesive.

8. The assembly according to claim 1 wherein said sensor element is a piezo-electric composite element.

9. The assembly according to claim 8 wherein said sensor element comprises:

at least two layers of piezo-electric composite, each layer having upper surface and a lower surface; and

an electrical insulator positioned between adjacent ones of said at least two layers.

10. The assembly according to claim 9 wherein said at least two layers are disposed at first and second different distances from said acoustically absorbing hub.

11. The assembly according to claim 9 wherein said at least two layers are disposed in planes parallel to a radius from said acoustically absorbing hub.

12. The assembly according to claim 9 wherein said electrical insulator is secured between a first layer of said at least two layers and a second layer of said at least two layers with a structural adhesive.

13. The assembly according to claim 9 further comprising an electrode on at least one of the upper and lower surfaces of each said sensor element.

14. The assembly according to claim 1 wherein a separate said sensor element is secured in each of said discrete chambers of said support structure.

15. The assembly according to claim 1 wherein:

said support structure is a cylindrical housing having a central axis with said vertical sectioning walls arranged radially thereabout, said acoustically

absorptive hub being positioned at the central axis of said support structure; and

said sensor element having an inner surface oriented toward said acoustically absorptive hub and an outer surface positioned away from said central housing, wherein said inner surface conforms to an outer surface of said acoustically absorptive hub and said outer surface conforms to the shape of said cylindrical housing.

16. The assembly according to claim 15 wherein:

said vertical sectioning walls of said cylindrical housing have a peripheral shape; and

said outer surface of said sensor element has a shape conforming with the peripheral shape of said vertical sectioning walls.

17. The assembly according to claim 1 wherein:

said support structure is a frusto-conical housing having a central axis with said vertical sectioning walls arranged radially thereabout, said acoustically absorptive hub being positioned at the central axis of said support structure; and

said sensor element having an inner surface oriented toward said acoustically absorptive hub and an outer surface positioned away from said central housing, wherein said inner surface conforms to an outer surface of said acoustically absorptive hub and said outer surface conforms to the shape of said frusto-conical housing.

18. The assembly according to claim 17 wherein:

said vertical sectioning walls of said frusto-conical housing have a peripheral shape; and

said outer surface of said sensor element has a shape conforming with the peripheral shape of said vertical sectioning walls.